Science & Technology Facilities Council
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A Flexible Component based Access Contr
Architecture for OPeNDAP Servic

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Background Themes

- Focus on two areas alluded to in the abstract:

1) *"Without ready means to restrict access to data for such services, data providers and data owners are constrained from making their data more widely available."*
   - Paradox: provision of access control can open access?!
     - illustrated by the BADC and OPeNDAP
   - But in the wider context of changing attitudes: data.gov.uk

2) *"The range of different security technologies available can make interoperability between services and user client tools a challenge."*
   - Vision of seamless access can seem remote:
   - Services too complicated, get in the way or simply broken
   - A need for flexible approach to enable support for different technologies

Inception

- Seeds planted with discussion started at this conference last year
- Solution based on the use of HTTP redirects
- OPeNDAP implementations have existing support for this*:
  1. Initiate request,
  2. server side security challenge
  3. Redirect to authentication endpoint
  4. Redirect authenticated client back to original requested URI
- NERC DataGrid Security and Python WSGI middleware
  - Security filter components arranged to give the desired access control configuration

* TDS: http://www.unidata.ucar.edu/projects/THREDDS/tech/reference/RestrictedAccess.html
PyDAP: http://pydap.org/client.html

Alternative Approaches to Authentication

- Why use redirects at all? Host service over HTTPS:
  - but then performance limitation for large datasets,
  - changes from a well known HTTP address to HTTPS – user confusion?
- HTTP Digest
  - Not secure enough
- What about SOAP?
  - An invasive approach which would change the interfaces breaking existing client tools
  - Unsuited to large dataset transfers

Coupled Model Intercomparison Project Phase 5

- CMIP5 is a framework for co-ordinated climate change experiments
- Will input into the IPCC 5th Assessment Report (AR5) scheduled for 2013

20 modelling centres	mid-2009: • Simulations Starting
50 numerical experiments	2009: • Model and Simulation Documentation needed
86 simulations (total ensemble members) within experiments	end of 2010: • Data available
6500 years of simulation	early to mid 2012: • Scientific Analysis, Paper Submission and Review
Data to be available from "core-nodes" and "modelling-nodes" in a global federation.	
Users need to find & download datasets, and discriminate between models, and between simulation characteristics.	early 2013!: • Reports

- Software infrastructure under development:

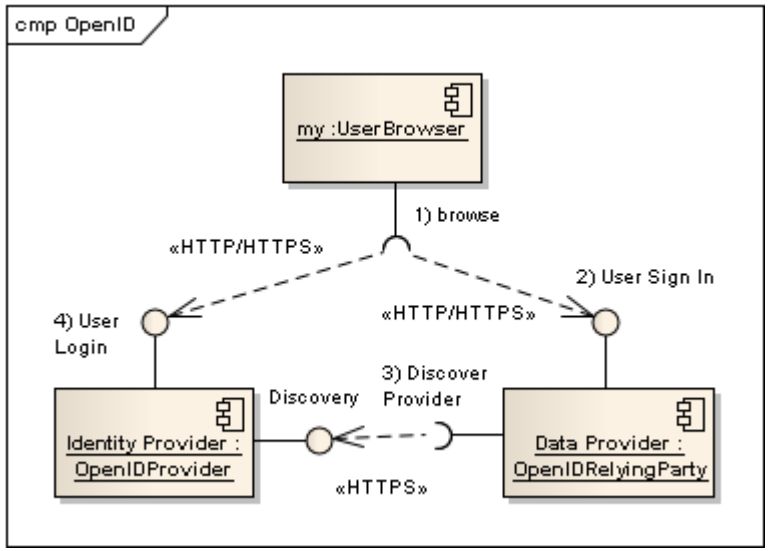
Earth System Grid

InfraStructure for the European Network for Earth System Modelling
is-enes

metafor

Earth System Curator

Earth System Grid Security: Single sign on



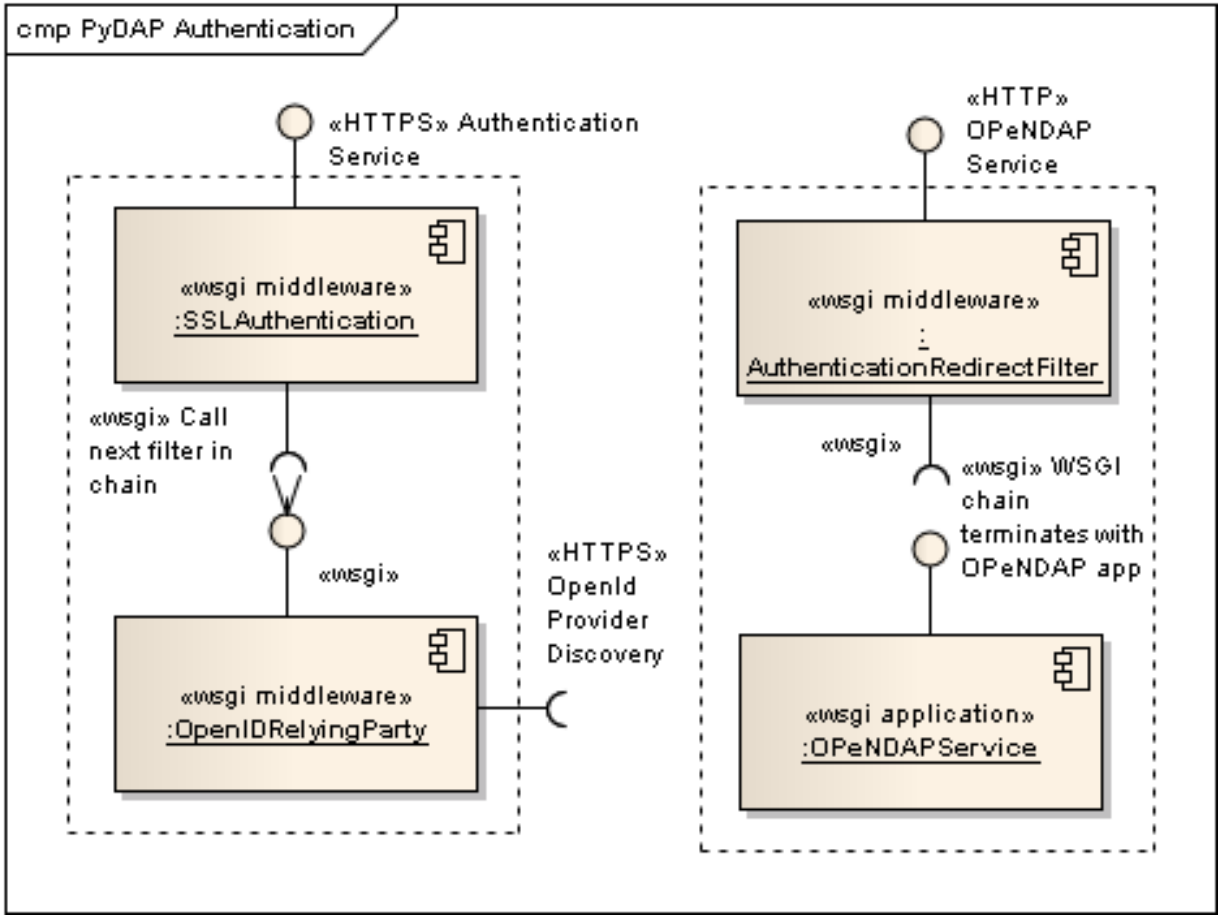
OpenID

- Users have an identity URI:
  - Identifies them and
  - an **OP** (**OpenID *Provider***), a service where they can be authenticated
- An **OpenID *Relying Party*** trusts the authentication assertion of a given OP
- SSL for mutual authenticate and enable RPs to whitelist trusted OPs

MyProxy
Credential Management Service

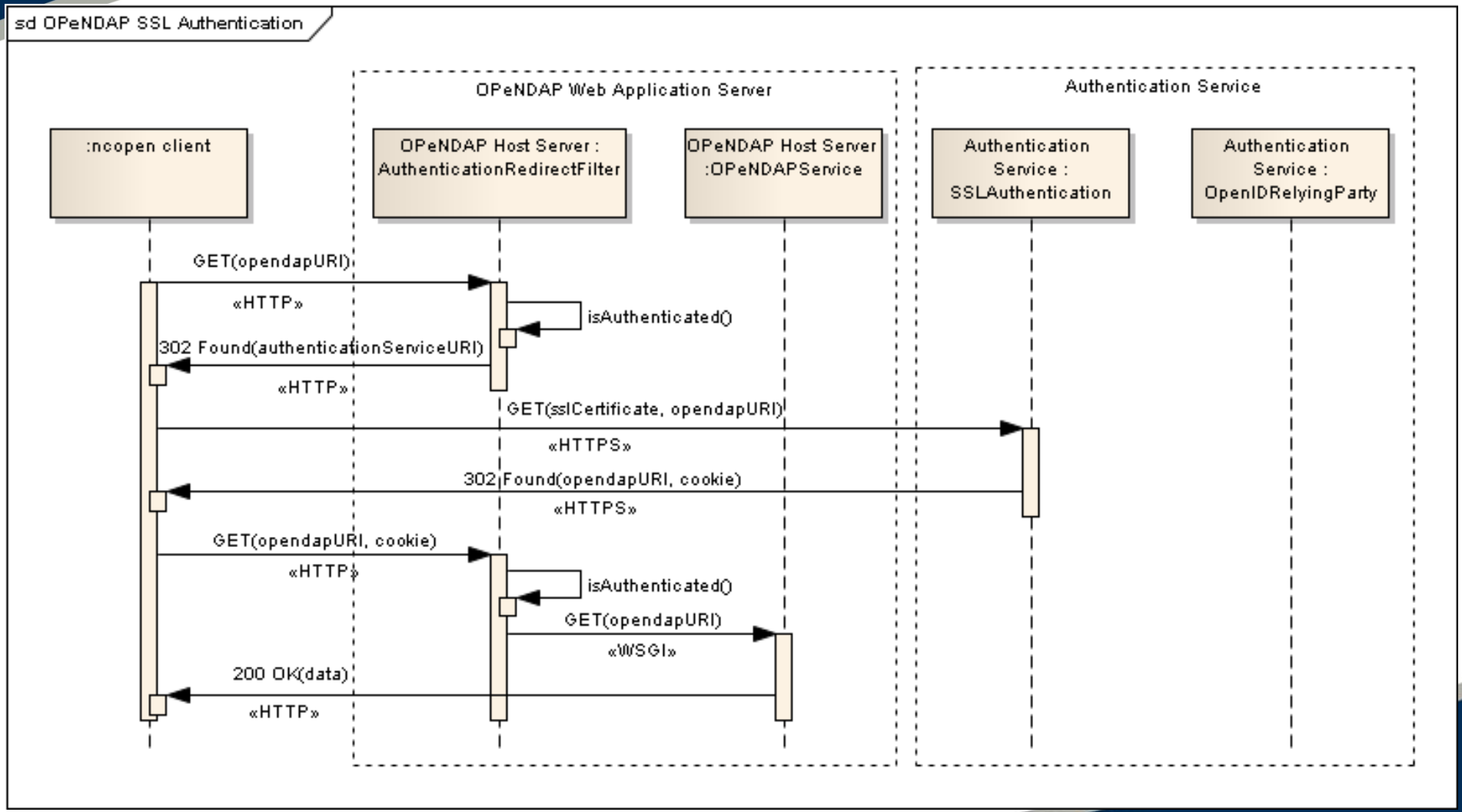
- OpenID less suited to non-browser based clients
- PKI based authentication - Grid based applications, OPeNDAP clients? ...

Filter Architecture



- OPeNDAP service is protected by an Authentication filter
- This redirects unauthenticated requests to an authentication service
- Authentication Service receives the client request
  - SSL client certificate based or
  - Default to OpenID based sign in

Filters in Action – ncopen client



More About Clients

- A server-side solution but what about the client side?
  - Browser
  - WGet and Curl – replacement to legacy ftp
  - NetCDF ncopen - patch
- Demo:
  - Browser based access
  - Command line access with wget